REMARKS

By this Amendment, claims 41-51 and 60-73 are pending in this application, with claims 41, 46, 49, 60, 63, 66, and 71 being independent claims. Claims 32-34 and 52-59 have been canceled. In place of the cancelled claims 32-34 and 52-59, new claims 63-65 and 66-73, respectively, have been added to more clearly define features of the present invention. No new matter has been entered.

In the Office Action dated April 8, 2003, the Examiner: rejected claims 32-34 under 35 U.S.C. § 102(b) as being anticipated by Berglund et al. (U.S. Patent No. 5,250,165); rejected claims 52-59 under 35 U.S.C. § 102(e) as being anticipated by Yang et al. (U.S. Patent No. 6,284,149); rejected claims 49-51 and 60-62 under 35 U.S.C. § 102(e) as being anticipated by Yang et al. (U.S. Patent No. 6,284,149); and rejected claims 41-48 under 35 U.S.C. § 103(a) as being unpatentable over Yang et al. in view of Nguyen et al. (U.S. Patent No. 6,043,164).

Applicant respectfully requests reconsideration and withdrawal of the rejections set forth in the above-identified Office Action.

35 U.S.C. § 102 Rejection Based on Berglund et al.

The Examiner rejected claims 32-34 under 35 U.S.C. § 102(b) as being anticipated by Berglund et al., according to the rationale discussed on paragraph 2 of the Office Action. Applicant has canceled claims 32-34. In place of the canceled claims, Applicant has added new claims 63-65 to more clearly recite the features of the present invention.

In order for a claim to be anticipated by a prior art reference under 35 U.S.C. § 102, all elements of the claim must be disclosed in the reference. A claim is anticipated

FINNEGAN
HENDERSON
FARABOW
GARRETT &
DUNNER LLP

1300 I Street, NW
Washington, DC 20005
202.408.4000
Fax 202.408.4400
www.finnegan.com

only if each and every element in the claim is found, either expressly or inherently described, in a single prior art reference. Berglund et al., however, does not disclose each and every element of independent claim 63. In particular, Berglund et al. lacks disclosure of a method having the recited steps, including, among other things, a step of "[after etching a film by utilizing a resist film as a mask,] removing the resist film substantially halfway with biasing power" and "thereafter removing the remaining resist film completely without applying any biasing power," as recited in claim 63.

Berglund et al. discloses an isotropic etch of mask layer 24, as shown in Fig. 3, after an initial anisotropic etch is completed. To perform the isotropic etch of the mask layer 24, RF generator 21 is deactivated, gas chemistry is altered to selectively etch the mask layer 24 with respect to layer 23, and pressure is increased to increase isotropy. However, once the gas distribution and pressure within enclosing member 12 is stabilized, RF generator 21 is activated to apply power to cathode 11 and create an RF plasma (See, e.g., col. 5, lines 41-53, of Berglund et al.). That is, the isotropic etch of the mask layer 24 in Berglund et al. is performed with the activated RF generator 21.

Apparently, the isotropic etch of the mask layer 24 in Berglund et al. is performed with applied biasing power and, therefore, cannot disclose the claimed invention having a step of "removing the remaining resist film completely without applying any biasing power," as recited in claim 63. At least for this reason, Berglund et al. fails to anticipate the claimed invention. Thus, reconsideration and withdrawal of this rejection is respectfully requested.

FINNEGAN
HENDERSON
FARABOW
GARRETT &
DUNNER LLP

1300 I Street, NW
Washington, DC 20005
202.408.4000
Fax 202.408.4400
www.finnegan.com

35 U.S.C. § 102 Rejections Based on Yang et al.

The Examiner rejected claims 52-59 under 35 U.S.C. § 102(e) as being anticipated by Yang et al., according to the rationale discussed on paragraph 3 of the Office Action. Applicant has canceled claims 52-59 and, in place of the canceled claims, added new claims 66-71 to more clearly recite the features of the present invention.

Yang et al. fails to anticipate the pending claims because Yang et al. does not disclose each and every element of independent claims 66 and 71. In particular, Yang et al. lacks disclosure of, among other things, a method step of "removing [a] photoresist film substantially halfway with [a] fence portion [of the layer distending upwardly]," as recited in claim 66, and "removing a fence portion of the layer formed during the etching process and distending toward the upper portion of the opening [that is smaller than the opening pattern of the layer]," as recited in claim 71.

The Examiner appears to assert that a polymer layer 206 (i.e., resulting from etching of the photoresist layer 204 and the oxide layer 202, as shown in Fig. 2A) somehow corresponds to the recited "fence portion." Applicant respectfully disagrees with the Examiner's interpretation of Yang et al. because the semiconductor structure of Yang et al. does not disclose the prerequisite structure recited in each of claims 66 and 71. For example, each of claims 66 and 71 recites that "the layer [covered by a photoresist film] has an opening, the photoresist film has an opening pattern exposing the opening of the layer, and the opening pattern of the photoresist film is larger than the opening of the layer," and "a fence portion of the layer distending upwardly." Yang

FINNEGAN
HENDERSON
FARABOW
GARRETT &
DUNNER LLP

1300 I Street, NW
Washington, DC 20005
202.408.4000
Fax 202.408.4400
www.finnegan.com

et al., however, discloses none of the above-mentioned structures. For example, the opening 208 of Yang et al. does not have the recited separate opening pattern and opening, where the opening pattern is larger than the opening. Nor does Yang et al. show a "fence portion" distending upwardly from the layer 202. Therefore, the polymer layer 206 cannot correspond to the recited "fence portion."

In addition, Yang et al. lacks disclosure of, among other things, "[after removing the photoresist film substantially halfway with the fence portion while applying a biasing power] stopping application of the biasing power with the photoresist film remaining and thereafter, removing the photoresist film completely, while utilizing the processing gas same as the processing gas for removing the photoresist film substantially halfway," as recited in claim 66, or "[after removing a fence portion of the layer [...] while applying biasing power to the workpiece] stopping application of the biasing power with the photoresist film remaining," as recited in claim 71.

Previously, Applicant has consistently pointed out the improperness of the Examiner's misinterpretation with respect to the teachings of Yang et al. and has requested reconsideration. Nevertheless, the Examiner continues to maintain his erroneous interpretation of the teachings of Yang et al., and continues to assert that "Yang clearly discloses applying a high frequency bias power on a wafer and 'the bias power applied on the wafer can be reduced, and even eliminated' in a subsequent step to remove the photoresist film," relying on col. 3, lines 38-46, of Yang et al.

The passage upon which the Examiner continues to rely, however, does not disclose any subsequent step in which a high-frequency bias power applied on the wafer is reduced or eliminated. Even if such a disclosure were present in Yang et al.,

FINNEGAN
HENDERSON
FARABOW
GARRETT &
DUNNER LLP

1300 I Street, NW
Washington, DC 20005
202.408.4000
Fax 202.408.4400
www.finnegan.com

this reference still does not disclose that such a reduction or elimination of the bias power is performed before the photoresist film becomes completely removed or after the photoresist film is removed halfway through. Therefore, Applicant once again urges that the Examiner carefully re-read the passage and reconsider this rejection. The passage in col. 3, lines 36-50, of Yang et al. reads as follows:

> "... a mixing gas pressure of about 20 mililitorr to 1 torr, an electrical power for generating plasma of about 1000 to 3000 W, a bias power on a wafer (not shown) of about 1 to 300 W, the wafer temperature of about -20° C to 400° C and a pressure of helium used as a backgroun gas of about 1 to 100 torr.
>
> As shown in FIG. 2B, the plasma using mixed gas as source has a high ability to remove the photoresist layer 204 and polymer layer 206, and the bias power applied on the wafer can be reduced, and even eliminated. Accordingly, the bombardment of the plasma to the photoresist layer 204 and polymer layer 206 is moderate, and the substrate 200 and oxide layer 202, which are in the opening 208, do not suffer plasma damage." (Emphasis added)

As becomes abundantly clear, nowhere does Yang et al. even suggest that the bias power applied on the wafer is reduced or even eliminated during the middle of a process. Instead, the reference merely discloses, for example, that because the mixed source gas in the plasma has a high ability to remove the photoresist layer and polymer layer, the bias power applied on the wafer can be reduced, and even eliminated from the conventional, higher bias power by using the mixed source gas (e.g., as discussed in the "Background of the Invention" section of Yang et al.), so that the substrate and oxide layer do not suffer plasma damage. The benefit of having reduced or no bias power is further discussed in col. 3, lines 50-53, of Yang et al. Therefore, it is clear that Yang et al. does not disclose a step of stopping application of the biasing power after removing the photoresist film substantially halfway.

FINNEGAN
HENDERSON
FARABOW
GARRETT &
DUNNER LLP

1300 I Street, NW
Washington, DC 20005
202.408.4000
Fax 202.408.4400
www.finnegan.com

If the Examiner continues to assert that Yang et al. clearly discloses the step of reducing the bias power applied on the wafer in a subsequent step to remove the phtoresist film, Applicant respectfully requests that the Examiner specifically point out where and how Yang et al. "clearly" discloses the recited elements discussed above because Yang et al. discloses to the contrary to the Examiner's assertion.

At least for these reasons, Yang et al. fails to anticipate claims 66-73. Thus, reconsideration and withdrawal of this rejection is respectfully requested.

The Examiner rejected claims 49-51 and 60-62 under 35 U.S.C. § 102(e) as being anticipated by Yang et al., according to the rationale discussed on paragraphs 4 of the Office Action. Applicant respectfully traverses this rejection.

Yang et al. fails to anticipate the claimed invention because Yang et al. does not disclose each and every element of independent claims 49 and 60. In particular, Yang et al. lacks disclosure of, among other things, "after [ashing the photoresist film while applying the high-frequency power for biasing to the workpiece], stopping application of the high-frequency power for biasing before the photoresist film becomes completely removed," as recited in each of claims 49 and 60.

For the similar reasons set forth above in the discussion of claims 66-71, Applicant respectfully requests reconsideration and withdrawal of this rejection.

35 U.S.C. § 103(a) Rejections Based on Yang et al. and Nguyen et al.

The Examiner rejected claims 41-48 under 35 U.S.C. § 103(a) as being unpatentable over Yang et al. in view of Nguyen et al. (U.S. Patent No. 6,043,164), according to the rationale discussed on paragraph 6 of the Office Action. Applicant respectfully traverses this rejection.

FINNEGAN
HENDERSON
FARABOW
GARRETT &
DUNNER LLP

1300 I Street, NW
Washington, DC 20005
202.408.4000
Fax 202.408.4400
www.finnegan.com

For the similar reasons set forth above, Yang et al. does not disclose "a fence portion distending toward the upper portion of a surrounding edge of the opening" and "switching the high-frequency power for biasing applied to the workpiece from the first power level to a second power level lower than the first power level before the photoresist film becomes completely removed," as recited in each of independent claims 41 and 46.

Regarding the deficiency of Yang et al. with respect to the recited structure of the fence portion, Nguyen et al. does not make up for the deficiency of Yang et al. Therefore, the asserted combination of Yang et al. fails to teach or suggest the claimed invention. Moreover, with respect to "switching the high-frequency power for biasing applied to the workpiece from the first power level to a second power level lower than the first power level before the photoresist film becomes completely removed," the Examiner asserts that, in response to Applicant's argument filed on January 31, 2003, "the examiner does not rely on Nguyen for the teaching of the etching gases or operational characteristics... [but] for the teaching of reducing/switching the high frequency bias power from the first power level to a lower second power level before removing the photoresist."

To reach a proper determination under 35 U.S.C. § 103, the Examiner must determine, in view of all factual information, whether the claimed invention "as a whole" would have been obvious at that time to a person of ordinary skill in the art and, in doing so, impermissible hindsight based upon applicant's disclosure must be avoided. In this instance, the Examiner clearly applied such an impermissible hindsight gleaned from the Applicant's disclosure and merely attempted to "mix and match" the elements of the

FINNEGAN
HENDERSON
FARABOW
GARRETT &
DUNNER LLP

1300 I Street, NW
Washington, DC 20005
202.408.4000
Fax 202.408.4400
www.finnegan.com

prior art to arrive at the claimed invention without any plausible suggestion or motivation. For example, ignoring the teachings of operational characteristics of Nguyen, the Examiner merely takes Nguyen et al.'s asserted teaching of switching from one power level to another power level and incorporated that teaching to Yang et al. "because Nguyen states that during the step of lowering the bias power the resist covering the dielectric is completely removed."

Applicant respectfully submits that one of ordinary skill in the art would not and could not ignore the operational characteristics associated with the asserted teaching of switching power levels because, as the Examiner stated, the effects of the switching powers to completely remove the dielectric is applicable only to the specific operational condition of Nguyen et al., but not to the operational condition of Yang et al. While switching power levels in Nguyen et al. may arguably result in some beneficial effects in Nguyen et al., it cannot be said that the same beneficial effects can be obtained in Yang et al. because Yang et al. and Nguyen et al. utilize distinctly different gases and operate under different operational characteristics.

When the references of Yang et al. and Nguyen et al. are read without such a hindsight gained from the Applicant's disclosure, there is no plausible reason that one of ordinary skill in the art would incorporate the Nguyen et al.'s asserted teaching of switching the power levels to Yang et al. because Yang et al. does not need such a switching step.

At least for these reasons, the asserted combination of Yang et al. and Nguyen et al. fails to establish a *prima facie* case of obviousness under 35 U.S.C. § 103(a). Thus, Applicant respectfully request reconsideration and withdrawal of this rejection.

FINNEGAN
HENDERSON
FARABOW
GARRETT &
DUNNER LLP

1300 I Street, NW
Washington, DC 20005
202.408.4000
Fax 202.408.4400
www.finnegan.com

CONCLUSION

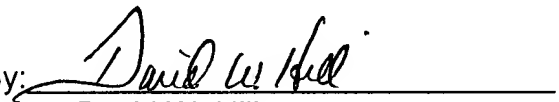
In view of the foregoing amendments and remarks, Applicant respectfully requests reconsideration of this application and the timely allowance of all pending claims.

Please grant any extensions of time required to enter this response and charge any additional required fees to our deposit account 06-0916.

Respectfully submitted,

FINNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER, L.L.P.

Dated: June 27, 2003

By: 

David W. Hill
Reg. No. 28,220

FINNEGAN
HENDERSON
FARABOW
GARRETT &
DUNNER LLP

1300 I Street, NW
Washington, DC 20005
202.408.4000
Fax 202.408.4400
www.finnegan.com